

DRAGON INTERNATIONAL PATENT OFFICE

北京银龙专利代理有限公司

By Airmail

January 21, 2004

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Y/R:JHTK-18-CN(2001 20 PCN0)
O/R:OIJP011130
TK/R: I-MYS-01183



Re: Chinese Patent Application for Invention

Chinese Patent Application No. 01136521.8

*Title: Incombustible Resin Composition, Prepreg, Laminated plate, Metal-clad
laminated plate, Printed wiring board and multi-layer printed board*

Applicant: HITACHI CHEMICAL CO., LTD.

Dear Sirs:

Please be kindly notified that we have received the First Office Action for the above patent application issued by the Chinese Patent Office dated December 26, 2003.

Enclosed please find this Office Action with its English translation attached for your attention.

The deadline for filing our response is April 26, 2004, which can be extended by one or two months upon filing a request for an extension with the CPO accompanied by an extension fee. The official fee for extension will be USD\$ 37.50 for one month and USD\$75 for two months. The attorney fee is USD\$80.

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In this office action, the examiner cites the Chinese Patent Application Laid-Open No. CN 1070061 A as a reference document, which claims priorities of JP 212129/91, filed on August 23, 1991 and US 07/769,281, filed on October 1, 1991 respectively.

In the following paragraphs, attorney's opinions will be given with respect to each paragraph of the detailed Office Action separately, or be incorporated into the analysis of each problem raised in the action.

1. Regarding to the 1st paragraph of the detailed Office Action

[Related claim: 1]

The responsible examiner of CPO considers that claim 1 may be rejected under Article 22.2 of the Patent Law of China on the grounds that the technical solution defined in claim 1 is not novel over document 1.

Document 1 discloses a flame retardant heating and electrical insulating resin composition for wire and cable, comprising the following (a) -(d) as essential components: (see lines 19 –23, page 4 of document 1)

(a) 100 parts by weight of a polyolefin (thereafter referred to as polymer 1);

(b) 60-120 by weight of a metal hydroxide or metal hydrate;

(c) 3-20 by weight of a polyolefin based polymer or a copolymer thereof grafted with a compound having a vinyl group (thereafter referred to as polymer 2);

(d) 1-10 by weight of a polysiloxane.

In the above composition, the combination of components (a) and (d) could be considered as a resin material, which corresponds to one essential component of composition in claim 1. The term "polysiloxane" may refer to the same chemical entity as "silicone", which is a unique polymer where such substances as organosilicone and

oxygen are connected through siloxane bonding. Accordingly, as for "silicone oligomer" in claim 1 of the present application is concerned, it should be construed broadly as meaning the same chemical entity as component (d) polysiloxane of document 1. The 60-120 by weight of a metal hydroxide or metal hydrate, which accounts for more than 31% by weight in the composition in document 1, covers the range of "the metal hydrate 20% by weight or more in the total solids of the resin composition" in claim 1. Since the three main components of claim 1 are all disclosed by document 1, claim 1 do not possess novelty over document 1.

However, in my opinion, there do have some differences between document 1 and the present invention.

First, there is a technical problem that when metal hydrates are blended to some extent, the heat resistance is rapidly lowered because the temperature at which the metal hydrates release water is lower than the melting temperature of the soldering. The corresponding technical solution provided by the present invention for this problem is based on the finding that, by using the silicone oligomers, they could cover the surface of the metal hydrate and enhance the temperature at which the metal hydrate releases the water held by itself. The mechanism for the above covering likes the adhesion mechanism of silane coupling agent since the silanol group at the end of silicone oligomers is capable of reacting with the metal hydrate to form a Si—O—M combination. While in document 1, it is indicated that in a resin composition comprising metal hydroxide or metal hydrate, a synergistic effect between the copolymer of polyolefin grafted with a compound having a vinyl group and polysiloxane could enhance the flame retardancy of the composition (refer to lines 1-2 from the bottom of page 4 to lines 1-4 of page 5).

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Second, the resins in the present invention are different with those in document 1.

We would therefore suggest the applicant to amend claim1 considering the above differences.

2. Regarding to the 2nd paragraph of the detailed Office Action

[Related claim: 2]

If we could persuade the examiner that claim 1 is novel, claim 2 should be allowed accordingly.

3. Regarding to the 3rd paragraph of the detailed Office Action

[Related claim: 3]

The examiner pointed out: "document 1 suggests that when the surface of metal hydroxide is treated by compound such as silane, the performance of the metal hydroxide could be improved." This could be drawn from lines 4-7 of page 8 of document 1. The original words in these lines are as follows:

" if a surface of a metal hydroxide or metal hydrate is treated with fatty acid, silane compound or titanate etc., the dispersion property thereof could be improved when they are dispersed in the polymer".

One example of the above said silane is vinyl trimethoxymethylsilane. With respect to this issue, we should provide a strong argument against the above view. An argument including some key points is drafted below for your reference.

In Comparative Examples 2-4 of the present application, γ-glycidoxypropyl trimethoxysilane, isopropyl tris(dioctylpyro phosphate) titanate and diphenyldimethoxy silane compound, which correspond to a silane coupling agent, a titanate and a silane

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compound, are used in place of the silicone oligomer of Example 1, and Tables 1 and 4 list the data of incombustibility and heat resistance of these examples. Comparing with Example 1, the values indicating the incombustibility are larger and the times indicating the heat resistance are longer in these comparative examples, and it can be concluded that flame retardant effects by using a silane coupling agent, a titanate or a silane compound as surface treatment agent are inferior to the one in Example 1 by using silicone oligomer as surface treatment agent.

The attorney still has one question concerning the above issue, that is

In document 1, is it possible that polysiloxane will also react with metal hydroxide or metal hydrate?

4. Regarding to the 4th to 6th paragraph of the detailed Office Action

[Related claims:4-7, 9-11; 12-16; 17]

If we could persuade the examiner that claim 1 is novel, these claims should be allowed accordingly.

5. Regarding to the 7th paragraph of the detailed Office Action

[Related claims: 1, 3, 8-11 and 17]

We suggest the applicant to further define the oligomer silicone by the degree of polymerization.

The above are our opinions concerning this office action. We hope it will be of help for you to have a better understanding and analysis of this office action.

Please kindly let us have your technical comments and further instructions on this

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matter well before the deadline so that our response to this Action will be prepared and filed in due time.

Should you have any questions, please do not hesitate to contact us.

Best regards,

Yours faithfully,

Dragon International Patent Office, Beijing


Patent Attorney Xinyan WANG

Enclosure

1. The original Notification of the First Office Action with its English translation.
2. Chinese Patent Application Laid-Open No. CN 1070061 A